

APPENDIX 10.1. NATIONAL ENERGY SAVINGS AND NET PRESENT VALUE USING ALTERNATIVE INSTALLATION COSTS AND ENERGY PRICE SCENARIOS

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APPENDIX 10.1. NATIONAL ENERGY SAVINGS AND NET PRESENT VALUE USING ALTERNATIVE INSTALLATION COSTS AND ENERGY PRICE SCENARIOS

10.1.1 INTRODUCTION

This appendix presents national energy savings (NES) and net present value (NPV) results for alternative installation costs (for non-weatherized gas furnaces and gas boilers), and alternative energy price scenarios from *AEO2003* for all product classes. The calculations of NES and NPV using the reference installation costs and the default energy price forecast are explained in Chapter 10, National Impact Analysis.

10.1.2 RESULTS USING ALTERNATIVE INSTALLATION COSTS

For non-weatherized gas furnaces, DOE calculated the NES and NPV using two alternative sources of installation costs: a 1994 Gas Research Institute (GRI) report, and data from Natural Resources Canada (NRCan) (see section 8.3.1.2 of Chapter 8, Installation Cost, for more details). For gas boilers, DOE calculated the NES and NPV using the GRI report as an alternative source of installation costs.

The results of these calculations are shown in Table 10.1.2.1 and Table 10.1.2.2 for non-weatherized gas furnaces. A comparison of the NES and NPV for non-weatherized gas furnaces using the installation costs from the Installation Model, the GRI report and the NRCan data are shown in Figures 10.1.2.1 and 10.1.2.2.

The NES is only slightly different among the three cases because of very small changes in shipments caused by the different installation costs. Using the GRI installation costs, the NPV is less favorable for all design options, except for the 81 percent, two-stage mod., no Cat. III design option. In this case, the NPV is higher with the GRI installation cost data because the incremental installation cost is lower in the GRI data set than in the Installation Model.

Using the NRCan Installation Costs, the NPV is slightly higher than the NPV using installation model (IM) costs for the 81 percent AFUE design options, but it is significantly higher for the condensing furnace designs. (The NRCanada installation costs for condensing furnaces are lower than in the Installation Model.)

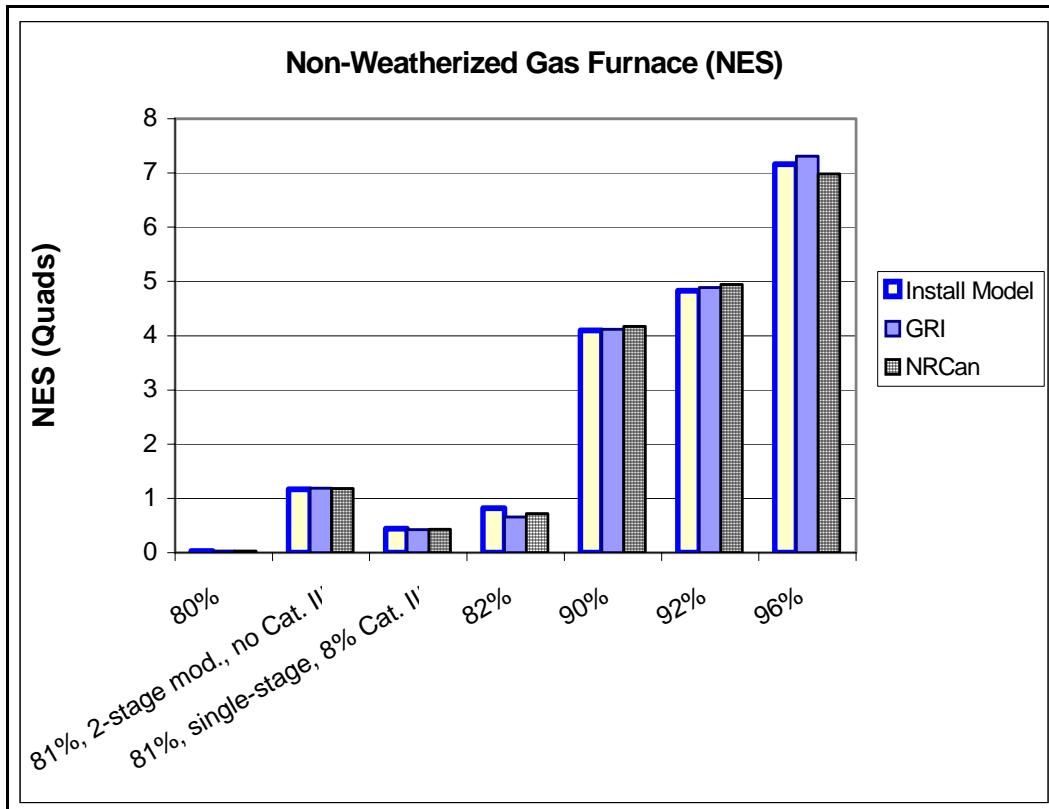


Figure 10.1.2.1 Non-Weatherized Gas Furnaces Installation Cost Scenarios (Quads)

Table 10.1.2.1 Cumulative National Energy Savings and Consumer Net Present Value for Non-Weatherized Gas Furnaces (GRI Installation Costs)

Efficiency Level (AFUE)	NES (Quads)	NPV (billion 2001 \$)
80%	0.03	-0.06
81%, 2-stage mod., no Cat. III	1.13	1.12
81%, single-stage, 8% Cat. III	0.42	-1.11
82%	0.66	-7.86
90%	4.12	-0.88
92%	4.89	-1.91
96%	7.31	-12.30

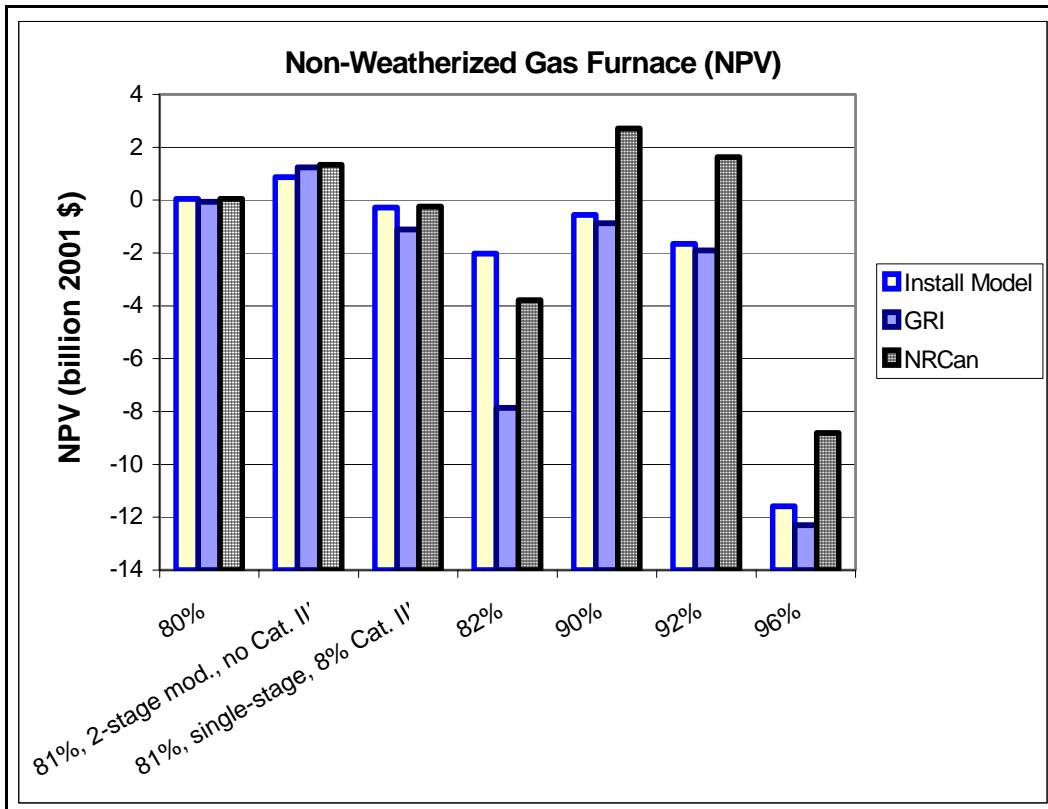


Figure 10.1.2.2 Non-Weatherized Gas Furnaces Installation Cost Scenarios (NPV)

Table 10.1.2.2 Cumulative National Energy Savings and Consumer Net Present Value for Non-Weatherized Gas Furnaces (NRCan Installation Costs)

Efficiency Level (AFUE)	NES (Quads)	NPV (billion 2001 \$)
80%	0.03	0.05
81%, 2-stage mod., no Cat. III	1.18	1.21
81%, single-stage, 8% Cat. III	0.43	-0.24
82%	0.72	-3.79
90%	4.17	2.71
92%	4.94	1.62
96%	6.98	-8.81

Table 10.1.2.3 shows the results of the NES and NPV calculations for gas boilers using the GRI installation costs. Figures 10.1.2.3 and 10.1.2.4 compare the NES and NPV calculated using GRI and IM installation costs. The NES varies only slightly for all design options. The NPV is slightly higher for non-condensing design options using the GRI cost data, and significantly more negative for the condensing design options.

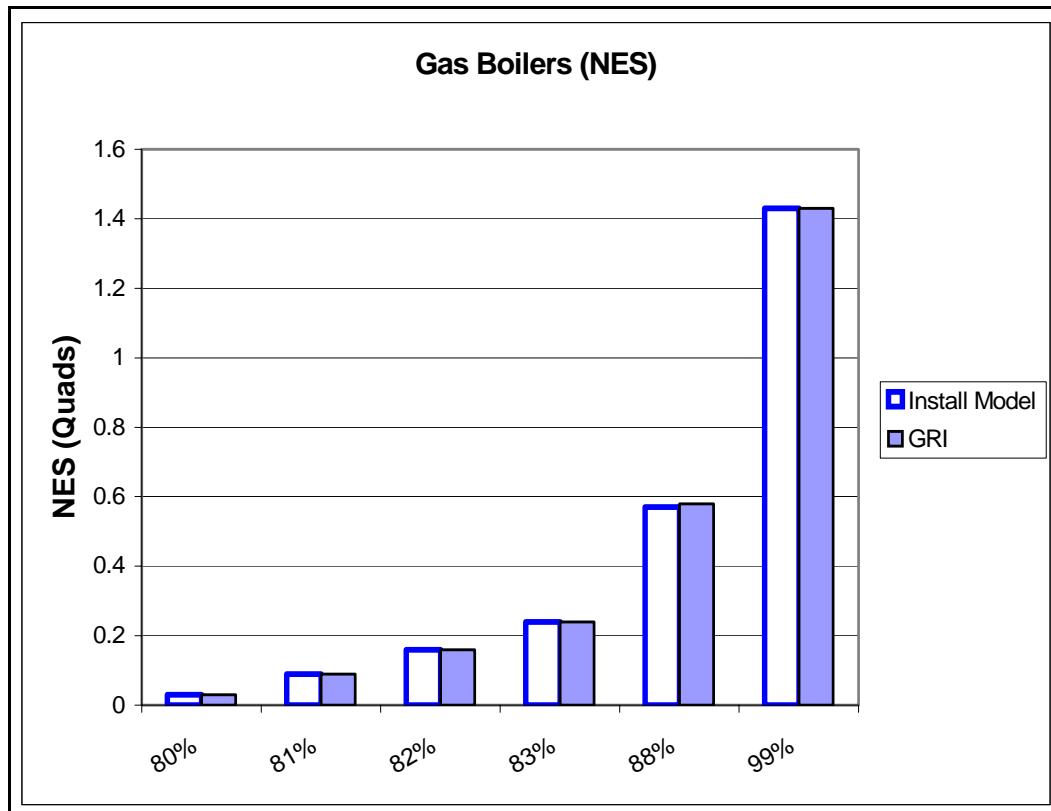


Figure 10.1.2.3 Gas Boiler Installation Cost Scenarios (Quads)

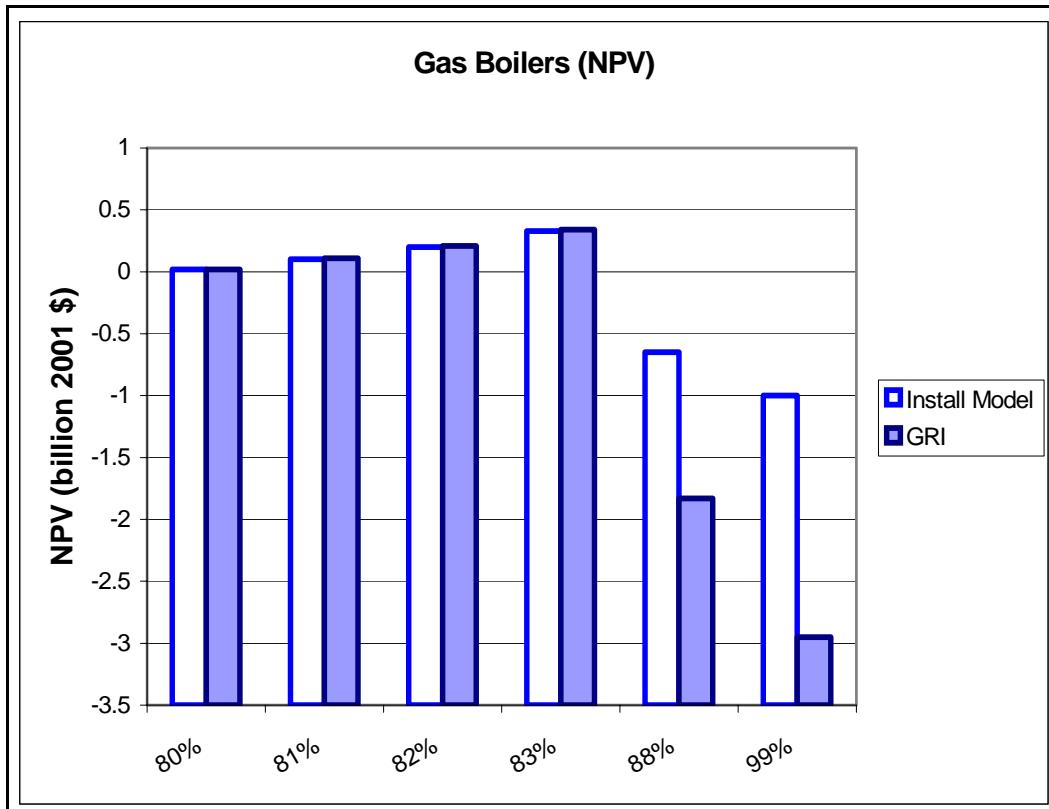


Figure 10.1.2.4 Gas Boiler Installation Cost Scenarios (NPV)

Table 10.1.2.3 Cumulative National Energy Savings and Consumer Net Present Value for Gas Boilers (GRI Installation Costs)

Efficiency Level (AFUE)	NES (Quads)	NPV (billion 2001 \$)
80%	0.03	0.02
81%	0.09	0.11
82%	0.16	0.21
83%	0.24	0.34
88%	0.58	-1.83
99%	1.43	-2.95

10.1.3 RESULTS USING ALTERNATIVE ENERGY PRICE SCENARIOS

For each product class, DOE calculated NES and NPV using energy price scenarios from the High and Low Economic Growth cases in *AEO2003* (see Appendix 8.4). The NES results are the same in each energy price scenario. As one would expect, the NPV is most favorable

using prices in the High Growth scenario, and least favorable using prices in the Low Growth scenario.

10.1.3.1 NES/NPV Results Using High Economic Growth Scenario

Table 10.1.3.1 Cumulative National Energy Savings and Consumer Net Present Value for Non-Weatherized Gas Furnaces (High Growth)

Efficiency Level (AFUE)	NES (Quads)	NPV (billion 2001 \$)
80%	0.03	0.05
81%, 2-stage mod., no Cat. III	1.17	0.89
81%, single-stage, 8% Cat. III	0.45	-0.26
82%	0.84	-2.08
90%	4.27	-0.19
92%	5.06	-1.31
96%	7.49	-11.54

Table 10.1.3.2 Cumulative National Energy Savings and Consumer Net Present Value for Weatherized Gas Furnaces (High Growth)

Efficiency Level (AFUE)	NES (Quads)	NPV (billion 2001 \$)
80%	0.01	0.02
81%	0.09	0.08
82%	0.19	0.15
83%	0.31	0.24

Table 10.1.3.3 Cumulative National Energy Savings and Consumer Net Present Value for Mobile Home Gas Furnaces (High Growth)

Efficiency Level (AFUE)	NES (Quads)	NPV (billion 2001 \$)
80%	0.01	0.02
81%	0.02	0.01
82%	0.02	-0.02
90%	-0.09	-0.43

Table 10.1.3.4 Cumulative National Energy Savings and Consumer Net Present Value for Non-Weatherized Oil-Fired Furnaces (High Growth)

Efficiency Level (AFUE)	NES (Quads)	NPV (billion 2001 \$)
80%	0.005	0.01
81%	0.02	0.04
82%	0.04	0.08
83%	0.05	0.11
84%	0.07	-0.15

Table 10.1.3.5 Cumulative National Energy Savings and Consumer Net Present Value for Hot Water Gas Boilers (High Growth)

Efficiency Level (AFUE)	NES (Quads)	NPV (billion 2001 \$)
80%	0.03	0.02
81%	0.09	0.11
82%	0.16	0.23
83%	0.24	0.37
88%	0.59	-0.59
99%	1.47	-0.85

Table 10.1.3.6 Cumulative National Energy Savings and Consumer Net Present Value for Oil-Fired Boilers (High Growth)

Efficiency Level (AFUE)	NES (Quads)	NPV (billion 2001 \$)
81%	0.003	0.007
82%	0.01	0.02
83%	0.02	0.04
84%	0.03	0.07
86%	0.09	-0.29
90%	0.26	-0.54

10.1.3.2 NES/NPV Results Using Low Economic Growth Scenario

Table 10.1.3.7 Cumulative National Energy Savings and Consumer Net Present Value for Non-Weatherized Gas Furnaces (Low Growth)

Efficiency Level (AFUE)	NES (Quads)	NPV (billion 2001 \$)
80%	0.03	0.04
81%, 2-stage mod., no Cat. III	1.10	0.73
81%, single-stage, 8% Cat. III	0.42	-0.25
82%	0.78	-1.85
90%	3.89	-0.40
92%	4.53	-1.41
96%	6.71	-10.57

Table 10.1.3.8 Cumulative National Energy Savings and Consumer Net Present Value for Weatherized Gas Furnaces (Low Growth)

Efficiency Level (AFUE)	NES (Quads)	NPV (billion 2001 \$)
80%	0.01	0.02
81%	0.08	0.06
82%	0.17	0.13
83%	0.28	0.20

Table 10.1.3.9 Cumulative National Energy Savings and Consumer Net Present Value for Mobile Home Gas Furnaces (Low Growth)

Efficiency Level (AFUE)	NES (Quads)	NPV (billion 2001 \$)
80%	0.01	0.02
81%	0.02	0.01
82%	0.02	-0.01
90%	-0.08	-0.30

Table 10.1.3.10 Cumulative National Energy Savings and Consumer Net Present Value for Non-Weatherized Oil-Fired Furnaces (Low Growth)

Efficiency Level (AFUE)	NES (Quads)	NPV (billion 2001 \$)
80%	0.005	0.01
81%	0.02	0.04
82%	0.04	0.07
83%	0.05	0.10
84%	0.07	-0.15
85%	0.09	-0.11

Table 10.1.3.11 Cumulative National Energy Savings and Consumer Net Present Value for Hot Water Gas Boilers (Low Growth)

Efficiency Level (AFUE)	NES (Quads)	NPV (billion 2001 \$)
80%	0.03	0.02
81%	0.09	0.10
82%	0.15	0.20
83%	0.23	0.32
88%	0.55	-0.62
99%	1.38	-0.95

Table 10.1.3.12 Cumulative National Energy Savings and Consumer Net Present Value for Oil-Fired Boilers (Low Growth)

Efficiency Level (AFUE)	NES (Quads)	NPV (billion 2001 \$)
81%	0.003	0.006
82%	0.01	0.02
83%	0.02	0.03
84%	0.03	0.06
86%	0.08	-0.27
90%	0.23	-0.52

10.1.4 RESULTS USING ALTERNATIVE ENERGY PRICE SCENARIOS—COMPARISON

The following figures graphically display the NES and NPV for all product classes under the low growth, the reference case, and the high growth energy price scenarios.

10.1.4.1 National Energy Savings (NES)

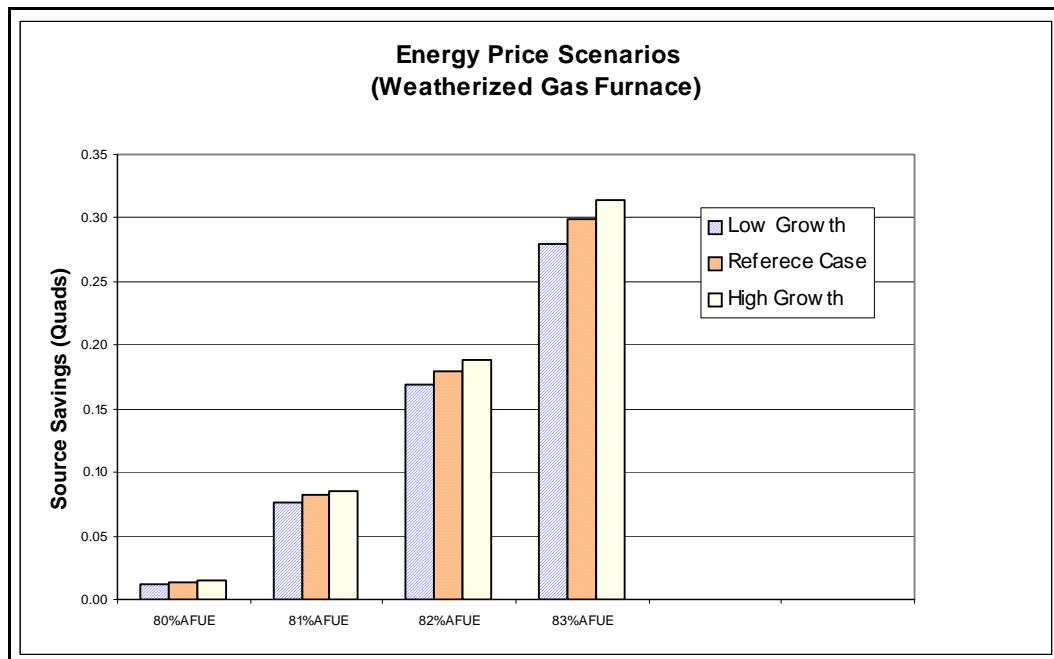
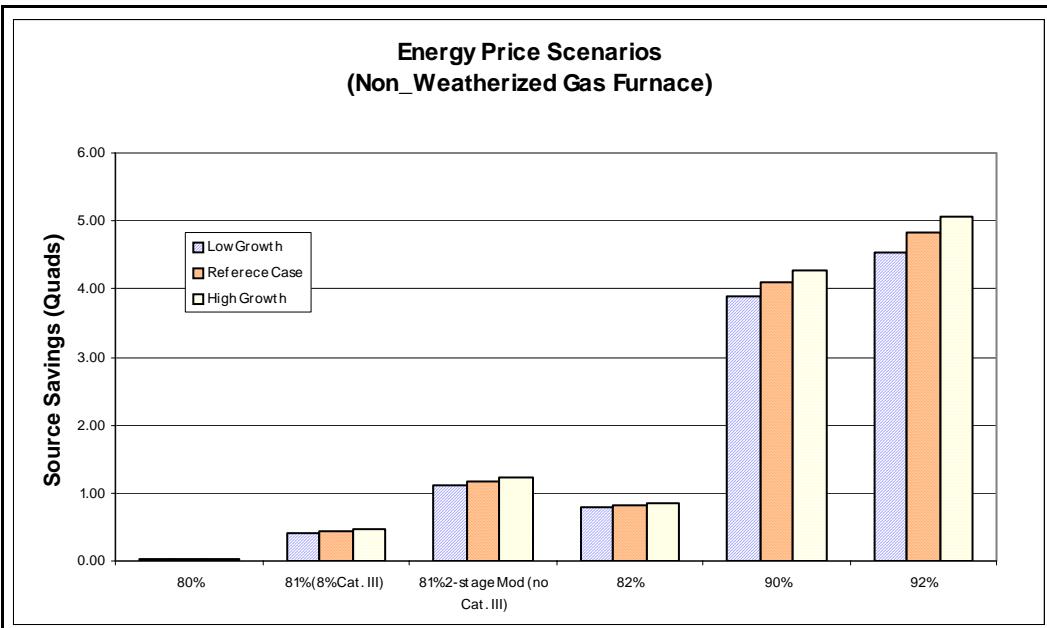


Figure 10.1.4.1 Weatherized Gas Furnace Energy Price Scenarios (Quads)



**Figure 10.1.4.2 Non-Weatherized Gas Furnaces Energy Price Scenarios
(Quads)**

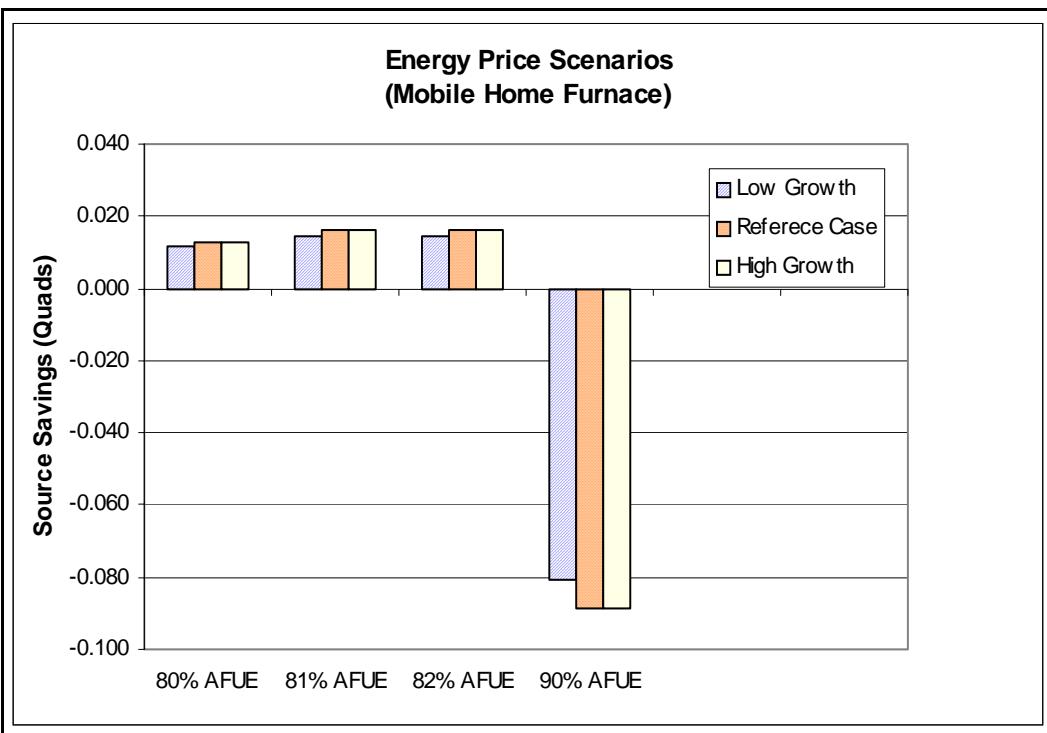


Figure 10.1.4.3 Mobile Home Furnace Energy Price Scenarios (Quads)

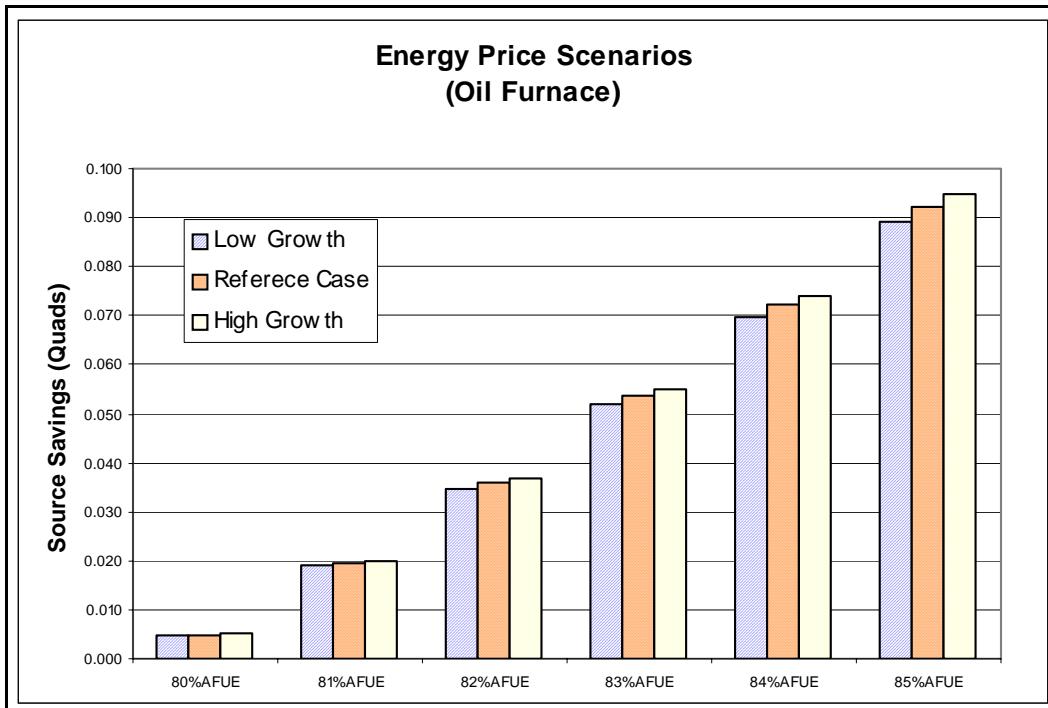


Figure 10.1.4.4 Oil Furnace Energy Price Scenarios (Quads)

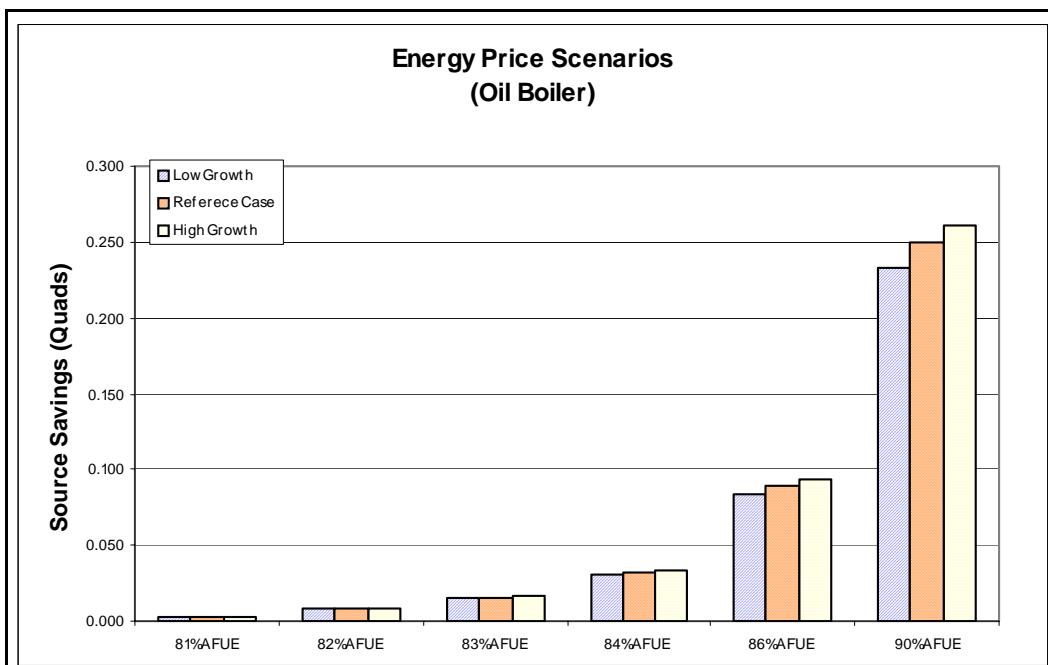


Figure 10.1.4.5 Oil Boiler Energy Price Scenarios (Quads)

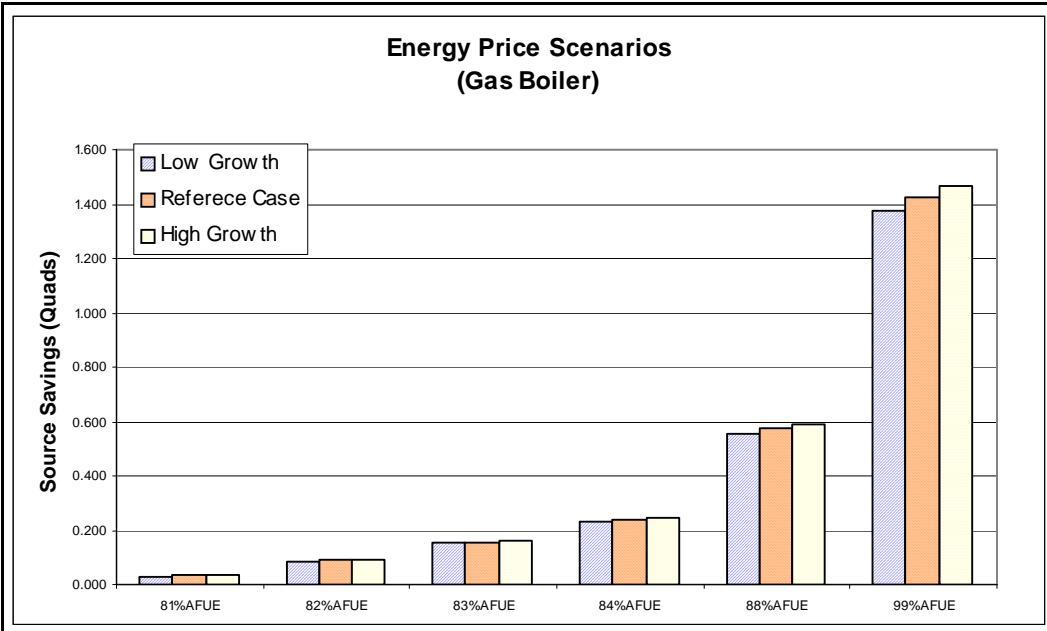
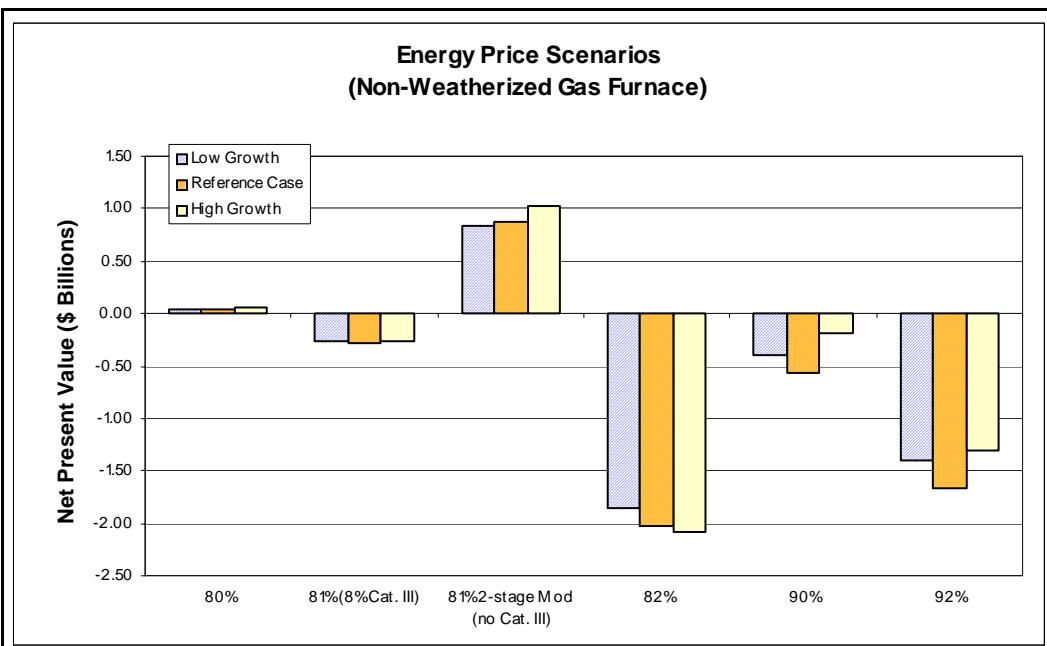


Figure 10.1.4.6 Gas Boiler Energy Price Scenarios (Quads)

10.1.4.2 Net Present Value (NPV)



**Figure 10.1.4.7 Non-Weatherized Gas Furnace Energy Price Scenarios
(NPV)**

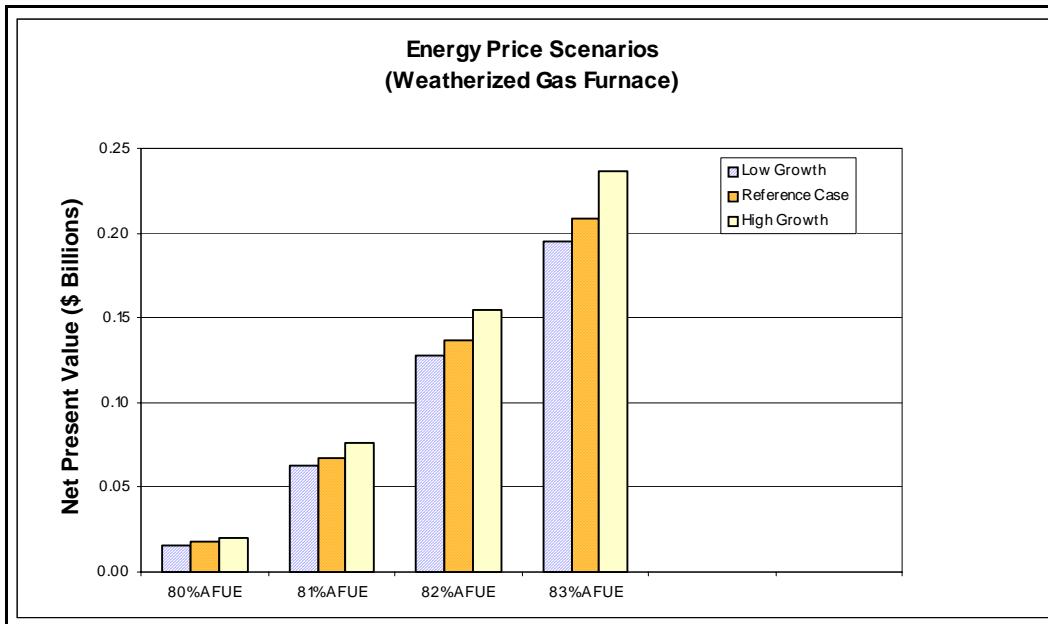


Figure 10.1.4.8 Weatherized Gas Furnace Energy Price Scenarios (NPV)

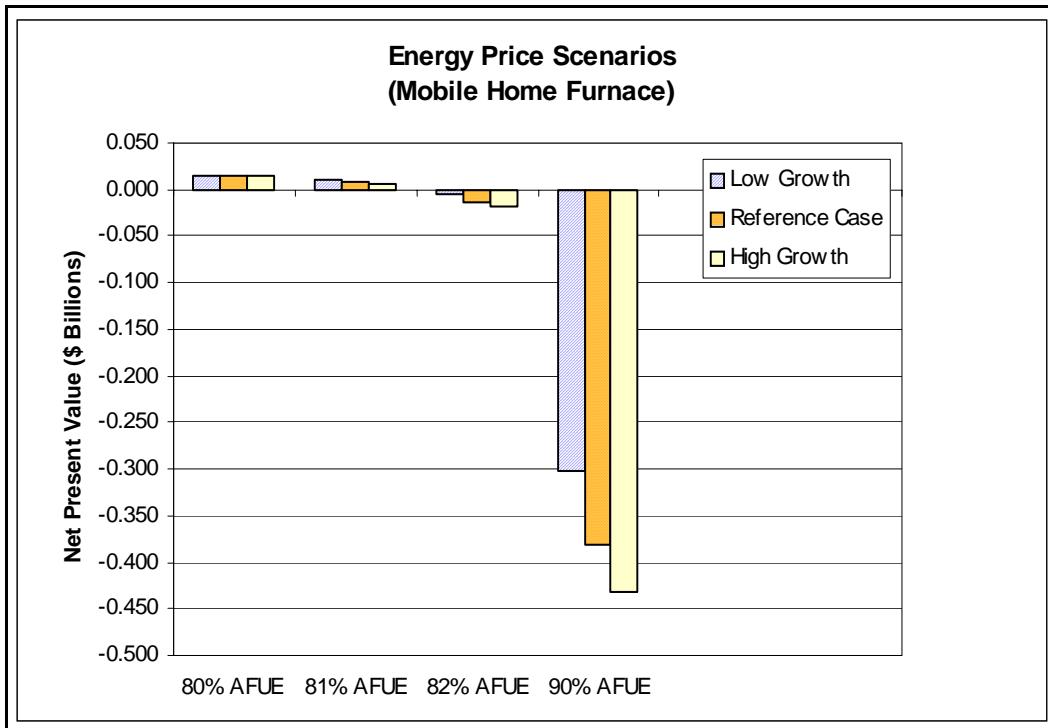


Figure 10.1.4.9 Mobile Home Energy Price Scenarios (NPV)

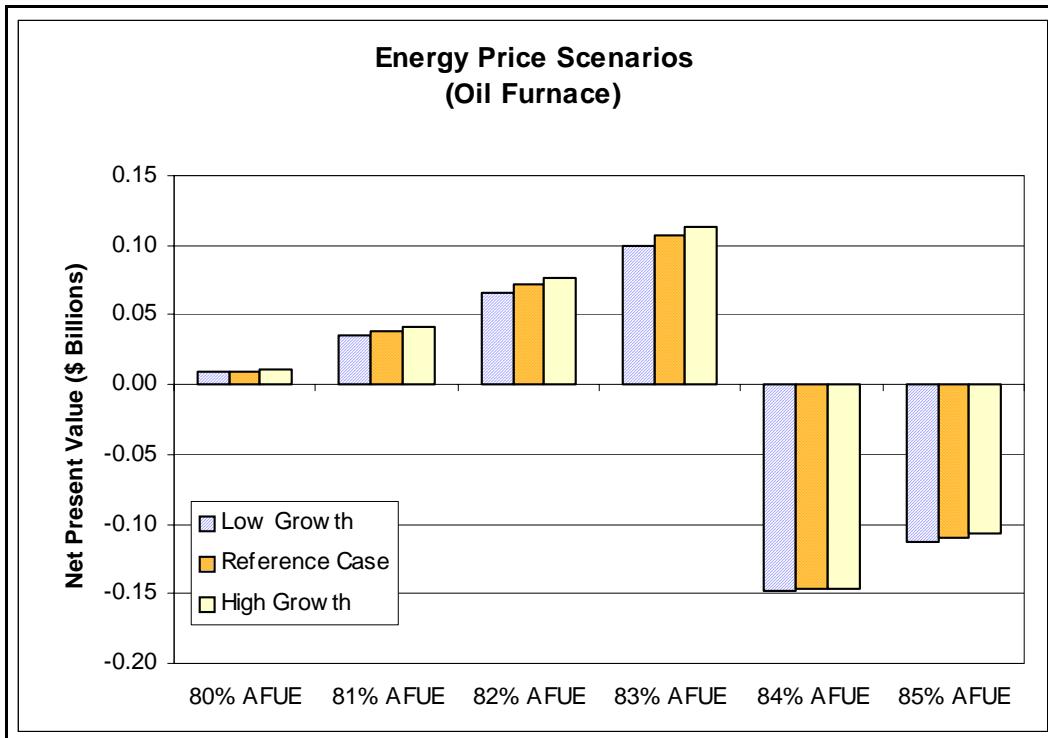


Figure 10.1.4.10 Oil Furnace Energy Price Scenarios (NPV)

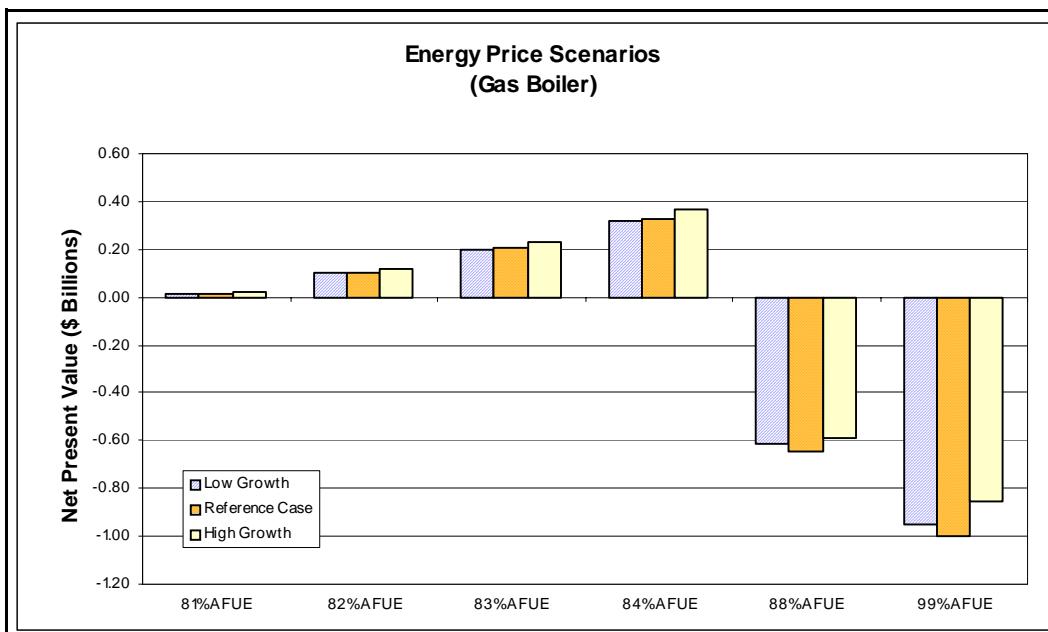


Figure 10.1.4.11 Gas Boiler Energy Price Scenarios (NPV)

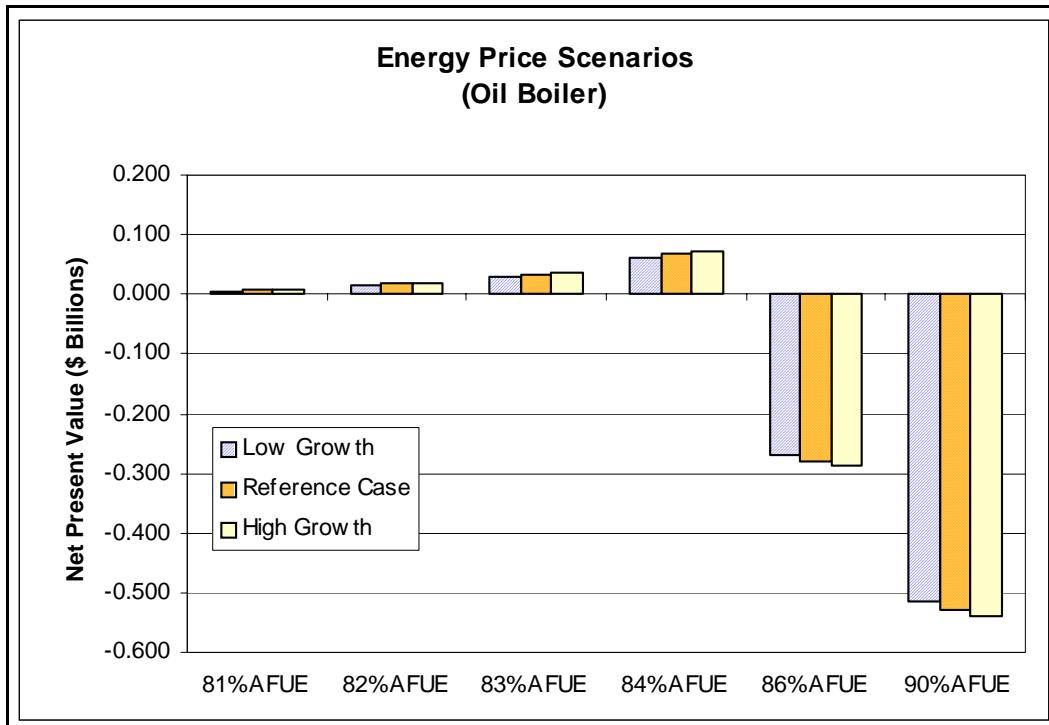


Figure 10.1.4.12 Oil Boiler Energy Price Scenarios (NPV)